



Modelling the effect of temperature change on the extrinsic incubation period and reproductive number of *Plasmodium falciparum* in Malaysia

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Abstract:

According to the report of the Intergovernmental Panel on Climate Change (IPCC), Malaysia will experience an increase of 3-5 degrees C in the future. As the development of the malaria parasite, *Plasmodium falciparum*, is sensitive to temperature, we investigated, using computer models, the effect of increase of 3 masculine and 5 masculineC on the possible changes in the epidemiology of malaria transmission of *P. falciparum* in Malaysia. Four environmentally different locations were selected: Kuala Lumpur (KL), Cameron Highlands (CH), Kota Kinabalu (KK) and Kinabalu Park (KP). The extrinsic incubation period (EIP) was estimated using hourly temperatures and the mean daily temperatures. The EIP values estimated using the mean daily temperature were lower than those computed from hourly temperatures in warmer areas (KL, KK), but higher in the cooler areas (CH, KP). The computer simulations also indicated that the EIP will be decreased if the temperature was raised by 3 masculine or 5 masculineC, with the effect more pronounced for the greater temperature increase, and for the cooler places. The vector cohort that is still alive at a time to transmit malaria (s(EIP)) also increased when the temperature was raised, with the increase more pronounced in the cooler areas. This study indicates an increase in temperature will have more significant effect in shortening the EIP in a cooler place (eg CH, KP), resulting in a greater s(EIP), and consequently increasing the transmission intensity and malaria risk. A temperature increase arising from the global climate change will likely affect the epidemiology of malaria in Malaysia, especially in the cooler areas.

Source: <https://drive.google.com/file/d/0B75lcx0mfp2OeEJpTS1DU3BUUIU/view>

Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Other Climate Scenario

Other Climate Scenario: increases in ambient temperature of 3 and 5 degrees celsius

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

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Climate Change and Human Health Literature Portal

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Mountain, Tropical, Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Malaysia

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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